MARCH 1969
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soil conservation

DEVOTED TO THE WISE USE OF LAND AND WATER RESOURCES

WILDLIFE ON PRIVATE LAND
Examples of habitat improvement on farmland
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Page 177

Regrassing the Sch

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SOIL CONSERVATION . S. DEPARTMENT OF AGRICULTURE

COVER: A fledgling robin just out of the shelter of the nest in a farmstead tree plantation finds a protected perch.

Dual cropping . . .

Wildlife by now is firmly established as a second crop on many conservation farms.

Reports from fieldmen submitted for this year's wildlife issue of *Soil Conservation* show convincingly that wildlife cropping is compatible with agriculture.

Examples prove the effectiveness of either individual (Utah, p. 176) or group (Calif., p. 173) action in increasing upland wildlife.

In managing wetlands, two Wisconsin farmers (p. 171) accomplished their purpose by draining part and flooding the rest of their acreage, thereby providing optimum conditions for both grain and wildlife crops on their land.

The same land-management techniques that work on farmland serve as well on refuges set aside specifically for wildlife, as Biologist Louis Moos reports (p. 177) from Montana.

Technical action: A year and a half ago we spotted the announcement that $99,000 in emergency funds had been allocated to help restore 11,000 acres of recently burned forest and range in Oregon.

A query to State Conservationist A. J. Webber brought the promise of a report when there were tangible results to show for the effort.

SCS Conservationist Ben Mouchett's account (p. 179) of prompt action by the local Technical Action Panel explains how a bad situation was prevented from becoming worse and records a significant conservation accomplishment.

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SOIL CONSERVATION is the official magazine of the Soil Conservation Service, published monthly by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business. Use of funds for printing this publication approved by the Director of the Bureau of the Budget July 17, 1968.

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Prepared in the Division of Information, Soil Conservation Service, U. S. Department of Agriculture, Washington, D. C. 20250

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A dual harvest: wildlife and cash grain

By separating wetland from dryland, brothers fashion a paying combination for their Wisconsin farm

By Jack W. Densmore
State resource conservationist, SCS, Madison, Wis.

Muskrats, wild ducks, corn, and soybeans may sound like a peculiar combination of crops on one farm. But the Van Straten Brothers of Shiocton, Wis., find the mixture just right.

With an ingenious system of dikes, ditches, and pumps, the brothers have wildlife wetland and productive cropland side by side on their thousand-acre eastern Wisconsin farm.

Thirty-five years ago, Harold and Dale Van Straten purchased a farm in the Black Slough, a low, wet-soil area subject to frequent flooding from the Embarrass River. An earlier attempt at group drainage had been only partially successful due to backwater from the river. Crop production was unreliable.

Harold, who was especially interested in hunting, trapping, and fishing, noticed that the flooding was harmful not only to corn and hay but also to wildlife and fish. Duck nests were destroyed and schools of fish were locked in pools that dried up in the summer.

Dale Van Straten was more interested in regular farm operations —corn, alfalfa, and (at that time) dairy cows. Due to flooding and poor drainage, crop yields were limited and erratic.

This dual interest led the brothers to separate the wildlife land from the cropland. They constructed a ditch at the edge of the cropland and placed the spoil on the wildlife side of the ditch to form a dike. The water in the ditches could then be pumped over the dike onto the wildlife land.

As cooperators with the Outagamie Soil and Water Conservation District, the Van Stratens have improved their wildlife land by constructing several miles of level ditches and 11 ponds. Each year they plant about 35 acres of food patches. To further improve drainage on their cropland, they have joined with eight other farmers in constructing a group drainage outlet served by a pumping station.

This water-control system has

Harold Van Straten feeds his trout while ducks keep their distance in the background

Harold (left) and Dale Van Straten sit on the dike that separates cropland from wildlife land. One of their eight small propeller pumps is immediately behind.

been modified and improved until today they have nearly 50 miles of dikes and ditches and eight pumping stations. The pumps are not in continuous use but operate only as needed to control the water on either the crop or wildlife land.

As a result, Dale points to full bins of corn and soybeans while Harold points with equal pride to the abundant wildlife crops.

In an average season, Harold traps some 3,000 muskrats and 35 to 50 mink on their 640 acres of wetland. In addition, 25 hunters from neighboring Fox River Valley cities pay him $200 apiece for the duck hunting rights. Harold has recently stocked two ponds with trout and two more with catfish with the hope of starting a fee fishing enterprise.

When Harold started selling hunting rights, he charged only $3 a person for a season and allowed as many as 200 hunters to use the area. He soon found that this many hunters "burned out" the birds. Twenty-five hunters with the present daily bag limits seems to be about right.

Increasing the number of ducks nesting on the farm or using the area in migration has been one of Harold's major interests. By lowering the water level on the wetlands during June and July, he provides safer nesting areas for the ducks and allows the smartweed and other food plants to grow on the exposed mudflats. In August the wildlife land is again flooded to provide a "banquet table" for the locally raised ducks and those stopping in migration.

Before the duck season opened last fall, the Van Stratens estimated there were 8,000 ducks feeding in their fields. Dale mildly complained, "The ducks made so much noise I couldn't sleep in the morning." ♦

RC&D project measures cover a broad range

The wide variety of activities that local people can carry on under the auspices of an RC&D project is shown in a tabulation of 2,852 project measures that had been activated in 28 projects as of July 1, 1968.

The measures are in 18 different categories, leaving 61 measures unclassified because they did not fit any group. To qualify as a project measure, an enterprise involves group or community action and produces benefits that accrue to the group.

Classified under "accelerated resource development" are accelerated soil surveys, conservation planning, forestry management, ACP cost sharing, special treatment areas, ground-water investigations, and similar services.

The "agricultural water-management development" group includes irrigation and drainage improvements of a group or community nature and not individual farm systems.

"Recreation development" includes outdoor land- or water-based developments of public agencies plus large individual privately owned developments classified as single project measures.

Accelerated resource developments	182
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Total	2,852

A wildlife sanctuary on a farm.

Farmers rebuild wildlife habitat

Program aims to bring back days of happy hunting in Yolo County

By Kenneth Bigelow
District conservationist, SCS, Woodland, Calif.

Farmers and sportsmen in Yolo County, Calif., have a program for bringing back the days, still vivid in their memories, when wildlife was plentiful and hunting was excellent.

In 1955 an estimated 10,000 hunters came to Yolo County, and 62,500 pheasants were taken. Daily bag limits before noon were not unusual. Hotels and motels were booked solid, and people waited three deep in restaurants.

Then changes in cropping practices—more rowcrops and weed-free cultivation—left wildlife with less food and cover. Their numbers decreased, especially pheasants, quail, and cottontail rabbits.

In 1962, only 3,900 pheasants were taken, mostly by local people. That year three soil conservation districts in the county and a local sportsmen's club developed a program to help landowners improve wildlife habitats on their land.

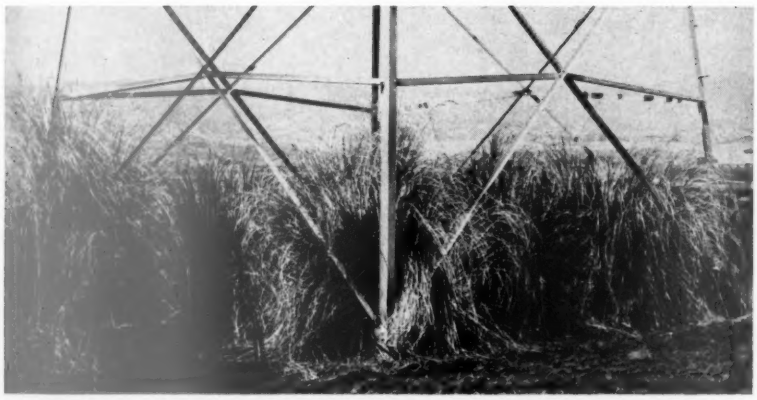
The program is administered by a committee of six members: one farmer from each soil conservation district and three sportsmen from the local sportsmen's club. The committee buys materials and distributes and stores plants for wildlife food and cover. The Soil Conservation Service and California Department of Fish and Game supply technical and material assistance.

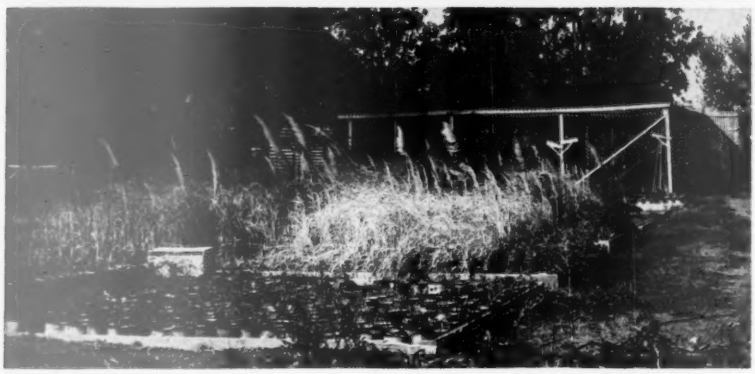
A technician from the fish and game department is assigned 2 days a week to the Soil Conservation Service office. The Soil Conservation Service trains fish and game personnel in farm planning and use of soil information, and they train soil conservationists in wildlife management and habitat development. The fish and game people and SCS people work together in preparing the wildlife phase of conservation farm plans.

Yolo County is intensively farmed, but the committee has found most farmers have several small plots that can be devoted to wildlife: Ditchbanks, equipment areas, roadways, fence rows, field diversions, and other odd places not being farmed. Since these areas may be sources of undesirable weeds, they are planted with shrubs. Most of the wildlife plants produce an abundance of color during the year, adding esthetic value in addition to wildlife food and shelter.

Most of the planting is on row

Multiflora rose border planting is one sign of habitat improvement.





Pampasgrass under a powerline (above) offers cover and nesting sites. A small nursery on the county jail farm (below) produces wildlife food and cover plants. This lowers the cost of building wildlife sanctuaries.

crop and orchard land with plants such as pampasgrass, pyracantha, dwarf blue gum, and multiflora rose. Quail roosts, brush piles, shrub plantings, and fiberglass quail guzzlers have been installed on several ranches.

In the past 8 years, wildlife plans have been made for an average of 20 farms and ranches a year, and landowners have planted an average of 7,000 plants annually.

The committee has succeeded in getting youth groups to participate. Local Future Farmers of America chapters in Esparto and Woodland raise multiflora rose from cuttings as a school project for credit. Boy Scouts and Girl Scouts use planting projects to earn merit badges.

About four times a year, Boy Scouts participate in a "conservation weekend." The boys camp out and help improve a ranch for wildlife with plants, fencing, and quail guzzlers.

Several farmers have set aside small acreages for sanctuaries that are open to the public for observation of wildlife. One large sanctuary includes 5,000 acres of undeveloped river bottom and adjacent cropland. This is a joint venture of 10 farmers who permit local youth groups to use the land as an outdoor classroom, camping, and conservation area.

The program was financed by local donations and grant-in-aid funds to the districts. These were matched by Yolo County sportsmen from their share of fines collected by the Fish and Game Department. The program has become almost self-supporting through help from the local jail farm where prisoners raise and care for plants.

The Department of Fish and Game has made generous game releases on farms and ranches with habitat plans. Pheasants, quail, cottontail rabbits, and chukars have been released in varying quantities.

The SCS reports there is a backlog of requests for planning assistance, and enthusiasm is high among farmers, ranchers, youth groups, and others concerned about encouraging wildlife development. ♦

Cumberland tributary resources studied

An Interagency Study Committee composed of representatives of the U. S. Army Corps of Engineers, Department of Agriculture, and Department of the Interior has been named to review and prepare resource plans for the entire Big South Fork of the Cumberland River in Kentucky and Tennessee.

Other interested federal agencies and Kentucky and Tennessee have been asked to participate in the study. The report is to be made to Congress by December 31, 1969.

Both the Soil Conservation Service and the Forest Service are deeply concerned with resource problems in the area and will participate in the study.

About 90 percent of the Big South Fork watershed is forested, and about a third of it is within the Daniel Boone National Forest in Kentucky.

Part of the drainage area has been intensively mined for coal, both by surface and subsurface methods. Unstabilized strip-mine waste is a serious source of sediment in streams. Acid drainage from abandoned mines also is a problem.

Potentials for watershed development in the upstream areas will be evaluated.

The committee is expected to propose alternative programs for using resources of the basin and contiguous areas for recreation, conservation, or preservation and indicate their potential benefits to the public and the local economy. ♦

Waterfowl for West Virginia

By William J. Melven
Field biologist, SCS, Morgantown, W. Va.

Waterfowl in the mountain state of West Virginia?

Well, yes.

West Virginia is not one of the "flyway" states, but wood ducks nest along the slower-moving streams, and black ducks and mallards are not uncommon.

Now, sponsors of the Upper Deckers Creek Watershed Project have included an intensive waterfowl habitat development to attract both nesting and migrating ducks and offset the effects of channeling a portion of the old stream.

Biologists from the West Virginia Department of Natural Resources and the Soil Conservation Service prepared the waterfowl management plan at the request of the Monongahela Soil Conservation District, the project sponsor. The State Division of Game and Fish agreed to reimburse the district for the purchase of affected land and to operate and maintain the installation.

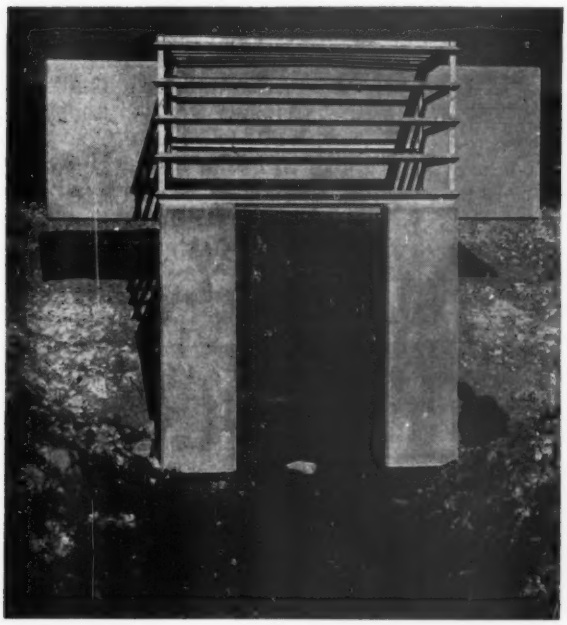
Two dams have been installed, one above the other, to impound a maximum of 15 surface acres of water. The upper structure holds enough water to flood the lower area and have some left for a resting pool.

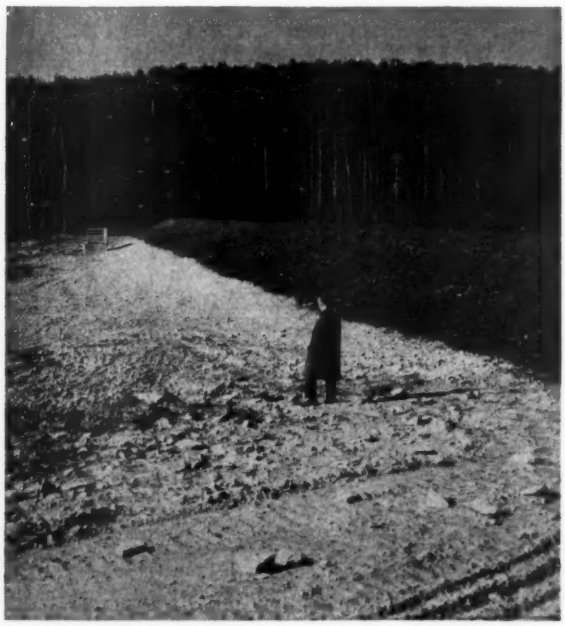
The state wildlife agency will seed annual grains in the lower area to provide food for the waterfowl. After the crop is mature, water will be released from the upper structure to make a feeding ground for the ducks.

Ponds have been built to attract ducks and other migrating waterfowl in various parts of the state, but water-level control for intensive management has not been used before in West Virginia. The Upper Decker's Creek development is the first of its kind in this state.

While most biologists don't really expect waterfowl to become an important game species in West Virginia, like deer or turkey, they do see the need to protect present waterfowl habitat and enhance the wetland areas that now exist. ♦

The water-level control structure (left) enables West Virginia biologists to impound water for ducks during the nesting season and drain the lake to make a feeding area in winter.





A cropping plan for wildlife food and cover makes dairy farm a choice hunting ground

By Verne E. Davison
Biologist, Regional Technical Service Center, SCS, Portland, Oreg.

"I don't hunt or sell hunting rights," explained Bill Schorr as we walked and flushed a score of ringnecked pheasants from good cover along his irrigation ditches and small fields at midday in October.

"I let my friends do the shooting. They killed 91 cock pheasants on my place during the 3-day season in 1967."

Schorr's small dairy farm is in the Salt Lake Soil and Water Conservation District in West Jordan, Utah. SCS District Conservationist Jim Gatherum has helped him plan his cropping system to include provision of food and cover for pheasants and other wildlife.

In the 5-day cock-pheasant season in 1968, Bill Schorr's friends enjoyed 73 hunter-days of sport and took home 80 pheasants. On opening day, they harvested 51 birds.

Of his 120 acres, 96 acres is irrigated. The other 24 includes 6 acres of proso millet and oats and 18 acres of cover (for the pheasants) that includes his shaded home grounds and dairy barns.

He has 33 acres of cow pasture, 36 acres of alfalfa hayfields, and 27 acres of corn and wheat.

He runs a dairy herd of 30 milkink cows and 20 replacements.

Schorr's annual pheasant harvest is a surprising yield from so small a farm. Three reasons account for his success:

(1) His exceptional cover for the birds includes Russian-olive, multiflora rose, a few conifers, and favorable growths of weeds—along his farm roads, about 20 feet on each side of his irrigation ditches, and around the homestead buildings.

(2) He feeds grain twice a day to his cows in the feedlot. The pheasants share the bounty throughout the winter and spring months.

A weedy zone 20 feet wide along each side of irrigation ditches on Bill Schorr's farm serves as a cover strip and provides food for pheasants and other wildlife.

(3) He purposely grows choice pheasant foods to feed the birds in late summer, fall, and early winter.

Waste grain incidentally left afield during harvest helps support the pheasants. There is no shortage of water or good nesting sites. ♦

Agencies unite to protect bald eagles in Alaska

The U. S. Bureau of Sport Fisheries and Wildlife and the U. S. Forest Service have signed an agreement to insure greater protection for bald eagles of southeast Alaska, where the largest numbers of this species live.

Terms of the agreement will be carried out through the regional forester for the Forest Service and the game management agent-in-charge for Sport Fisheries and Wildlife. Both are in Juneau.

The major feature of the agreement is the protection of nest trees in areas where timber sales, road construction, or other operations by man are planned. ♦

USDA awards grant to Israel for conservation studies

Ways to identify agricultural resources by remote sensing equipment carried by aircraft (and eventually satellites) will be studied by scientists at Purdue University, Lafayette, Ind., and the University of Michigan, Ann Arbor and Willow Run, under contracts totaling $514,000 awarded by USDA.

The studies are sponsored by the Agricultural Research Service in cooperation with the National Aeronautics and Space Administration.

Agricultural surveys by satellites equipped with optical and electronic sensors could, among other things, identify the world's agricultural resources and help underdeveloped countries in stepping up lagging food production and in developing natural resources, according to ARS officials. ♦

Freezout Wildlife Management Area

By Louis M. Moos
Biologist, SCS, Bozeman, Mont.

One of the best locations for bird watching in Montana is the Fish and Game Department's Freezout Wildlife Management Area located in Teton County, along Highway 89, between Fairfield and Choteau. During 4 days of June 1968, I recorded 96 species of birds in the vicinity of the lakes, marshes, and uplands of this area.

Bird watching activities begin the last week of March when spring migrants arrive at the lake. One of the greatest attractions occurs the last weekend of March when large congregations of snow geese and whistling swans stop to rest on their northward migrations. An estimated 350,000 snow geese and 11,000 whistling swans have been on the area at one time, plus hundreds of thousands of migrating ducks. Most of the migrations are over by mid-May.

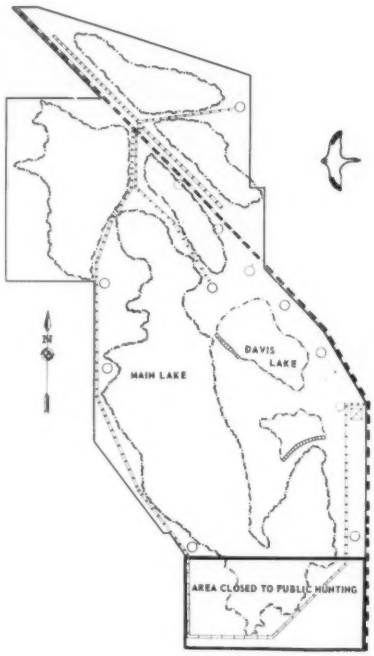
Nesting activity is high from mid-April to the end of May. The young make their appearance the latter part of May or early June.

A show of young birds

The last week of June and first 2 weeks of July are a good time to observe the broods of young ducks and shorebirds. You can also see young grebes riding on the backs of the adults—a characteristic mode of transportation for the very young of this species.

During October and November, ducks, geese, and swans again congregate here in large numbers on their southward migration.

The area originally was a glacial lake bed which dried up each summer. In 1955, the Soil Conservation Service provided technical assistance to develop a complete conservation plan for the area. A soil survey helped select the best areas for crops to be grown for food for



waterfowl and pheasants. Less productive soils were flooded to make additional marshlands. Some uplands were seeded to grass, some planted to trees and shrubs, and others left undisturbed to provide food and cover for wildlife.

A large drainage ditch and dikes were constructed with control structures so water could be maintained at proper depths. Six separate shallow water ponds were created. The dikes serve as roads, and it is possible to drive around much of the marsh area and observe, at close hand, courting waterfowl, nesting ducks and shorebirds, and the broods and young of many water-loving species of small birds.

A varied habitat

The management area now consists of 12,000 acres with many miles of mudflat shorelines; 6,000 acres of water; 800 acres in cropland; 3,000 acres in grassland. Some 20,000 trees and shrubs have been planted. A large island in the largest lake, and numerous manmade islands, provide important nesting sites for thousands of California gulls.

The lake supports an abundant growth of submerged vegetation, mostly sago pondweed (*Potamogeton pectinatus*) and widgeongrass (*Ruppia maritima*), which are important waterfowl foods.

Saltmarsh bulrush (*Scirpus robustus*), formerly called alkali bulrush (*Scirpus paludosus*), grows abundantly in shallow water and is a choice food of snow geese. The seeds are a good food for ducks—canvasback, bluewinged and greenwinged teals, gadwall, lesser scaup, mallard, pintail, redhead, shoveler, and widgeon. Muskrats use bulrush stems for house building.

Large colonies of Franklin's gulls nest in the bulrush; also coots, ducks, eared grebes, yellowheaded blackbirds, and sora rails. In 1967, an eared grebe colony was located in saltmarsh bulrush where 1,330 nests were found in an area about 1 acre in size.

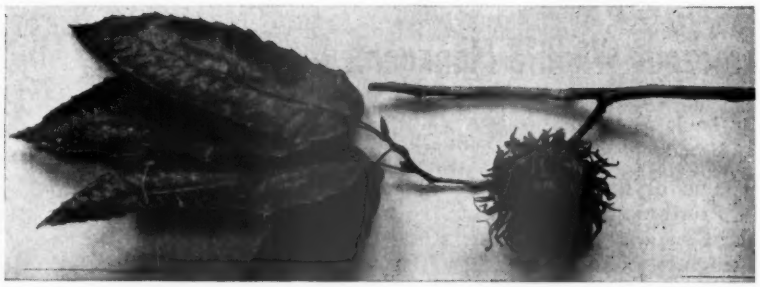
An increasing number of ducks nest on the area each year. Other species nesting here include avocet, black tern, cormonant, horned and western grebes, killdeer, longbilled curlew, longbilled marsh wren, marbled godwit, phalarope, redwinged blackbird, sandpiper, and willet.

Among the upland birds nesting here are Brewer's blackbird, crow, eastern and western kingbirds, horned lark, lark bunting, longspur, marsh hawk, meadowlark, ringnecked pheasant, shorteared owl, and vesper sparrow.

For the past 10 years, Audubon Society members from Billings and Bozeman have spent a weekend, about mid-June, banding young gulls, shorebirds, and yellowheaded blackbirds. In 1968, the group banded 2,000 California gulls, 1,900 Franklin's gulls, and several hundred shorebirds and yellowheaded blackbirds in 2 days. ♦

Sawtooth oak holds promise as wildlife plant for Southeast

By Jesse Mercer, Jr.
Biologist, SCS, New Albany, Miss.



The sawtooth oak (*Quercus acutissima*) is growing up as a promising improvement for woodland wildlife habitats in Mississippi.

In the search for a dependable mast producer to supplement native hardwoods, the Soil Conservation Service and the Mississippi Game and Fish Commission began testing the sawtooth oak in 1952. Since that time about 15,000 seedlings have been distributed for test planting to soil conservation district cooperators in the Southeast by the SCS plant materials center, Coffeeville, Miss.

Favorable results have encouraged the SCS to extend its test plantings of the sawtooth oak to selected areas within the Yazoo and Little Tallahatchie River Flood Prevention Area of North Mississippi. During the winter of 1967-68, through the cooperation of landowners and the U. S. Forest Service, 14,000 seedlings were planted. SCS will evaluate these plantings annually to determine the limitations and value of this plant under field conditions.

An 8-year-old sawtooth oak is 28 feet tall and produced 30 pounds of acorns in a year.

The sawtooth oak is native to Japan, Korea, China, and the Himalayan area. It is described as a roundheaded tree reaching 80 feet high at maturity. The leaves have the appearance of chestnut leaves. The acorns require 2 years to mature and are similar in size to those of white oak.

The sawtooth oak is not new to the United States. A specimen at the U. S. Plant Introduction Station at Savannah, Ga., planted in 1923, is 18 inches D.B.H., 50 feet high, and has a canopy spread of 75 feet. Records indicate its complete adaptation to growing conditions in Massachusetts and western New York, and recent plantings show that it is well adapted to the Southeast also.

Most of the information we have on the sawtooth oak in the United States was obtained from two plantings. One, on the University of Georgia campus, consists of 21 seedlings planted in 1937. The other planting consists of 16 seedlings furnished by SCS and planted by the Mississippi Game and Fish Commission on the Choctaw Game Management Area near Ackerman, Miss., in 1952. The average height of the trees on the Choctaw Game Management Area in 1962 was 30 feet. Some trees produced acorns in 1957 when they were only 6 years old. With the exception of 1967, the acorn crops have been regular and progressively heavier each year since. Yields collected when the trees were 10 years old averaged 29.5 pounds of acorns per tree.

These plantings indicate that sawtooth oak has the following advantages:

(1) The acorn is a choice food of deer and squirrel.

(2) This oak is a much heavier and more dependable producer than native oaks.

(3) The tree begins producing at an early age (6 years of age compared to about 20 years for native oaks).

(4) It is not subject to excessive damage by insects, weather, or decay.

(5) The acorn is not attractive to nongame species, particularly grackles and other flocking birds, thereby making the most available primarily to game species.

The sawtooth oak has aroused some apprehension and unanswered questions. Its value as a commercial tree has not been determined. Foresters wonder if it might become a "weed" tree. So far none of the plantings studied has increased in number of trees.

Vegetative competition has been held to a minimum on the study sites, and the question on the game manager's mind is: "Will this oak survive without care?" The plantings being made within the Yazoo-Little Tallahatchie River watersheds should give the answer. ♦

Joe Soloy, the seeding contractor, is at the controls of a helicopter taking on seed for a run over the Schoolmarm Burn. This equipment seeds about 8 acres a minute in a 70-foot swath.

TAP and the Schoolmarm Burn

By Ben Mouchett
District conservationist, SCS, The Dalles, Oreg.

Technical Action Panel moves quickly to heal effects of forest and range fire

When several lightning strikes touched off a massive, destructive fire in late August 1967, folks around The Dalles, Oreg., found out what a Technical Action Panel is and does.

The Wasco County Technical Action Panel (TAP), made up of representatives of U. S. Department of Agriculture agencies in the county, wasted no time organizing an all-out effort to overcome a disaster with potential for becoming even greater.

Three costly days

In 3 days of hot, stubborn fury, fire ravaged grass, brush, and timber on nearly 11,000 acres of rugged mountain land in the Schoolmarm Springs area between Mt. Hood and the Columbia River. More than 8,000 acres was private farm and ranch land; another 1,200 acres was federal land managed by the U. S. Bureau of Land Management.

The truly critical area was more than 1,200 acres of watershed where The Dalles, a town of some 12,000 people, gets its water supply. With fall, winter, and spring rain, snow, and runoff approaching, the denuded slopes were ripe for erosion which could pollute the water supply.

The area was still hot and smoldering when Wasco County TAP members held an emergency meeting August 24 at the request of Northern and Central Wasco soil and water conservation districts to plan strategy for protecting the area.

On hand were Eugene Denny, Farmers Home Administration, TAP chairman; Leland Hardy, Soil Conservation Service, representing Ben Mouchett, district conservationist and cochairman; Les Fredrickson, Agricultural Stabilization and Conservation Service; Robert Chadwick, Forest Service; and Tommy Thompson, Extension Service.

The situation was grim. True, the fire was controlled. But blackened tree trunks stood starkly in a desert of fine, white, still-smoldering ashes—all that remained of the grass and brush that once protected the steep slopes.

Seeding was the obvious answer, but the seed would not germinate until late spring. Seed and soil, meanwhile, would be at the mercy of rain and runoff water. Diversions to slow the runoff and direct it to safe watercourses would help. But action was needed—fast.

On-the-ground planning

A tour of the area was promptly arranged. This time, in addition to the federal TAP members, representatives of the State Department of Forestry, State Game Commission, Oregon State University, soil conservation district, and the city of The Dalles took part.

The upshot of the tour: The local SCS staff was given technical leadership for the rehabilitation project. Applications for emergency federal and state help were to be pushed through swiftly. All involved agencies and private indi-

viduals would cooperate with the financing and the work as much as possible.

Bill Caldwell, State Department of Forestry, provided helpful low level aerial photographs of the burn area.

Less than a month after the tour the Secretary of Agriculture announced that the Department would allocate $99,000 for the rehabilitation. Subsequently, state and local agencies pledged $65,000, the Agricultural Stabilization and Conservation Service pledged $40,000 in matching funds to farmers, and the Bureau of Land Management pledged $23,000.

A contract was made with Merric, Inc., of The Dalles to seed the area by helicopter. On October 26 seeding started, and by November 13 it was completed on the burn area. By December 9, the diversions were completed and fire trails and other disturbed areas were seeded.

Charred tree trunks and logs tell of the devastation of this mountain range by the fire in August 1967. Prompt action in reseeding the burn had restored a grass cover by the following spring. At right, Ben Mouchett, SCS district conservationist, looks at a reseeded slope and, below, shows the vigorous root system on a seedling. Scorched cropland, at right, was loosened with a rotary subsoiler, and diversions were constructed across fire trails, below, to reduce erosion.

All that man could do

In a little more than 100 days from the time of the first emergency TAP meeting, an imposing list of local, state, and federal agencies and 30 landowners had gotten together and completed all that they could do to protect the natural resources damaged by the fire.

The diversions would help during the months immediately ahead —how effectively depending on how heavy precipitation and runoff would be. The seeding would help next year after grass, brush, and trees were established.

There are many smiling faces now in The Dalles and in the offices of agencies that pitched in with landowners to get the job done.

The grass has covered most of the burn area. Only some of the south slopes failed to "take," where the soil is thin and steep. Even there native grass is coming on.

Nature seemed to cooperate with the concerned landowners and conservationists. All winter, precipitation was light, and no heavy runoff developed. Then the rains came in May and the grass began to shoot up in a carpet of green among the black trunks and logs. The crisis was past. Nature will do its own seeding from now on.

The inventory of what was accomplished in those hectic days after the fire is impressive:

Nearly 123,500 pounds of grass seed in varying mixtures were broadcast by Joe Soloy of Merric, Inc.

Trees and shrubs from seed

Bitterbrush seed was added for wildlife in seeding 1,100 acres of city watershed—a recommendation of the Oregon State Game Commission. Paul Ebert, biologist for the Oregon State Game Commission, reports good germination of bitterbrush seed. An examination of the area in August 1968 showed more than 600 live tree seedlings per acre. A check of a similar area that was not seeded showed only 67

live tree seedlings per acre from natural seeding.

Three hundred and fifty acres in the city watershed were seeded with ponderosa pine and douglas fir seed.

Nearly 350 acres of burned cropland was subsoiled to aid water penetration into the soil.

Some 2,700 feet of diversions were constructed on burned cropland to lead excess runoff water into protected outlets.

Forty-two miles of fire trails were constructed and "waterbarred" to reduce erosion in the surrounding areas. These small hillside diversions were built 150 feet apart and averaged 25 feet long—adding up to a total of more than 35,000 feet of diversions.

The 42 miles of fire trails also were seeded to grass to help stabilize the soil. This is equivalent to 138 acres of seeding in this highly critical area.

Around Wasco County, especially The Dalles area, TAP is no longer just another alphabet title for some government bureau. "Technical" means know-how, and "action" means just that.

Ernest Kuck, rancher and owner of more than 3,000 acres in the burn, says: "This was a necessary job that gave excellent results."

Joe Hasbrouck, public works superintendent, city of The Dalles: "There is a good grass cover in the city watershed that will certainly help protect the city filtering plant."

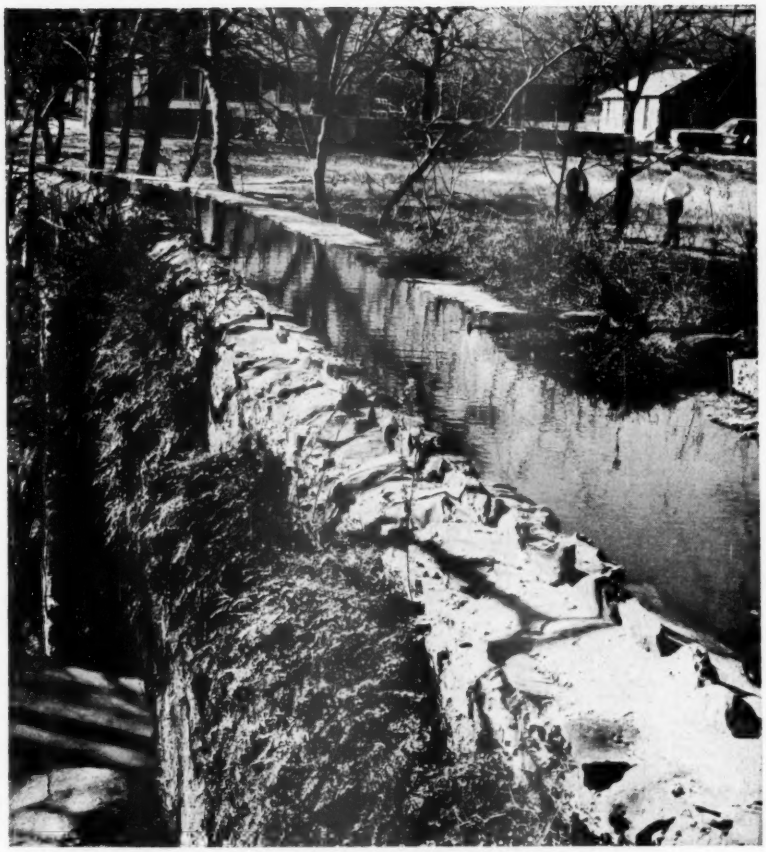
Bob Bailey, chairman of the Northern Wasco Soil and Water Conservation District, who chaired the early organizational meetings while the application was being developed: "Good example of what agency and private individual cooperation can do."

To TAP members, it means confidence. They know that through TAP they can work together and get things done—in a hurry if necessary. The Schoolmarm Burn rehabilitation proved that. ♦

Work of Spanish padres still waters Texas crops

By J. C. Ward

Civil engineer, SCS, Fredericksburg, Tex.



An aqueduct, built across a stream in 1731, still carries water for irrigation.

What did Franciscan padres in the early 1700's have in common with modern conservationists? The answer, many conservationists and engineers are amazed to discover, is that both have used the same soil and water conservation standards to build irrigation systems.

The Espada and San Juan diversions were built sometime between 1731 and 1745 on the San Antonio River and are still watering Texas crops. Sound construction has made them the oldest continuously used irrigation system in the United States.

Stone by stone

Espada Dam is a mile north of the famous Mission San Francisco de la Espada in the Alamo Soil and Water Conservation District. The dam was hand-built by Franciscan padres and Indian converts by laying flagstones on a natural stone ledge foundation.

It is said that the mortar was mixed with goat's milk to make it waterproof and then allowed to dry slowly, stone by stone. The lime salts, carried by the water, have been deposited among the stones to fill the crevices and form a solid dam.

Today's experts marvel at this remarkable engineering feat. It takes one exception with current standards, as it is "curved the wrong way," yet it has withstood hundreds of destructive floods.

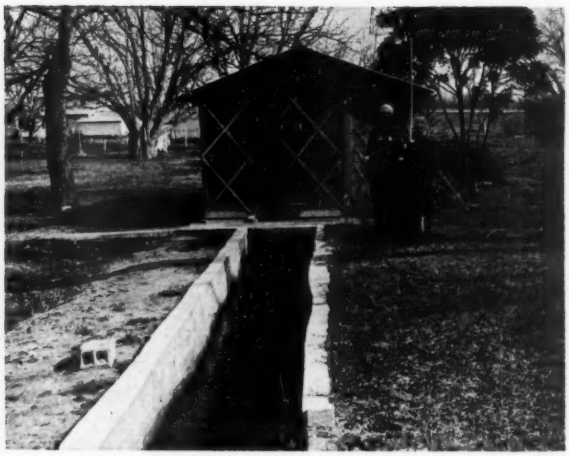
Espada Dam diverts some 4,500 gallons of water a minute into a 4-mile long irrigation ditch known as Acequia de Espada. It was built by Indians 20 feet at a time, but how the nonerosive grade of 10 feet per mile was engineered is unknown.

The acequia provides irrigation water by gravity flow for about 400 acres of land near Mission San Francisco de la Espada. A massive stone aqueduct crossing at Piedras Creek is preserved as a historical monument by the San Antonio Conservation Society.

A similar system, called the San Juan, is located 1 mile above the Espada diversion dam and was built at the same time. In 1910, the 5-mile long San Juan acequia irrigated 17 farms; today 770 acres are irrigated on 30 farms.

The water rights for the San Juan and Espada diversion dams and acequias date back nearly 250 years and are still legally recognized. Mr. and Mrs. Garrett Lewis, who own 12.5 acres on the San Juan ditch, can trace their water rights back to 1824 when Mexico still owned Texas. At their summer cottage built across the acequia, they can fish and relax to the timeless tune of running water.

Water rights today are patterned after the Spanish system. In those days, the King had to grant the right to divert water—the laws did not permit altering the flow of a river or using the water without first obtaining a permit from the



Henry Graf, commissioner for the Espada District, displays turnips raised on part of the 500 acres irrigated by the Espada irrigation system. At right, Mr. and Mrs. Garrett Lewis enjoy their cottage built over the San Juan ditch.

Spanish Government. Any dam on a river, whether navigable or not, required a permit from the supreme government.

A farmer's grant

Here's a sample Spanish irrigation permit quoted from records of the Supreme Court of Texas, Report No. 8304: "In 1823, Francisco Maynez filed his application for 'three days of irrigation water with the corresponding land for cultivation.' The application of Maynez was forwarded to the Aguntamiento of Bexar on December 23, 1823. On the 5th of February, 1824, Don Antonio Saucedo issued a title in these terms '—knowing of the merits of the petitioner Francisco Maynez, his good behavior and his devotion to agricultural toil, I have decided to grant him and do hereby grant him in the name of the Mexican nation, two dulas of water with the accompanying land for cultivation, the water to be taken from the conduit of the Mission of San Juan Capistrano so that as his property, he may cultivate and enjoy the land within the terms prescribed by law, and so he and his successors may profit from it, with the lien (pension) of ten pesos annually which he must pay for the said two dulas granted him for the period of four years, in accordance with the provisions of the Excellent Provincial Deputation. After which he may enjoy the two dulas of water, clear of all encumbrance and as such, he may sell or alienate them at his pleasure—'."

Timely portions

A dula, according to grants and documents of early Texas history, is equivalent to a day of water from an acequia. Spanish rights defined dula as "all that time in which the water for irrigation, divided in days between the different plats or estates, would flow their course until all of the plats would enjoy the water, and then the turn would start anew."

In 1900 local landowners founded the San Juan Irrigation Company. Each landowner adjacent to the acequia owns a share in the company. Each receives water at the rate of ½ hour for each acre of land he owns. The watering cycle is set to rotate every 10 days on the 5th, 15th, and 25th of each month. A local employee, Jim Maspero, has been a ditch rider on this project since 1918.

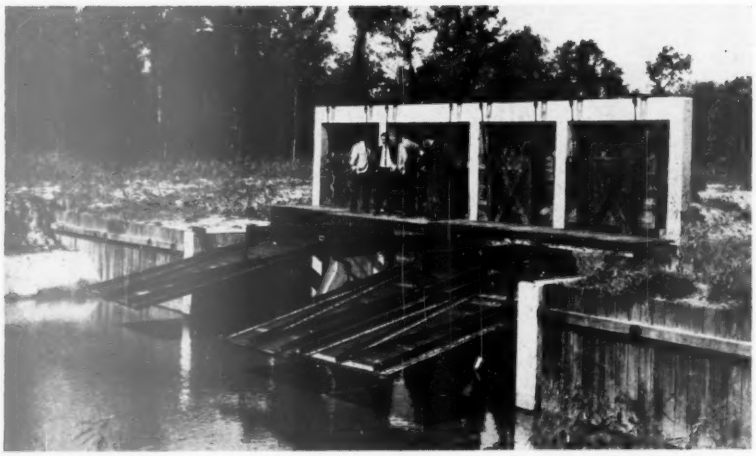
The Espada Irrigation Company allots 1 hour of water for each acre of land. With the type of soil found in this area, the forethought and planning of the early settlers fit in very closely with present-day conservation irrigation requirements. Crops produced are vegetables, grain sorghums, small grain, and irrigated pastures.

The San Juan and Espada irrigation dams, acequias, and aqueducts are remarkable feats of engineering. They justly deserve all historical recognition given them by the State of Texas, the city of San Antonio, and the San Antonio Conservation Society. ♦

Survey reveals erosion in New South Wales

Some 48 million acres of land in the Eastern and Central Divisions of New South Wales is affected by soil erosion, according to results of a survey conducted in 1967 by Australia's Soil Conservation Service.

The area subject to gully erosion had increased about 2 million acres since a similar survey 25 years ago, in spite of the fact that 1.6 million acres had been treated with structural works, and the erosion brought under control. A reduction of 15½ million acres has occurred in the areas affected by sheet and wind erosion, but more than 3 million acres subject to these types of erosion has deteriorated to gully-type erosion. ♦



Four water-control structures like this in the Seventh Ward Canal prevent salt water intrusion, maintain a fresh water level for irrigation up the canal, and give protection from flooding.

Louisiana project controls tidal waters

By Gene Warren
Assistant to State conservationist, SCS, Alexandria, La.

Salt water won't bother Louisiana rice farmers in Vermilion Parish any more since the Seventh Ward Canal Watershed Project turned back the Gulf tides with a gate structure that serves three purposes.

It keeps floodwaters from backing up the Seventh Ward Canal from the nearby Vermilion River, keeps salt water out of the canal during high tides and drought, and keeps in fresh water during low tides and strong north winds.

"We feel that the project has already just about paid for the $138,000 invested in it by keeping salt water from our back doors this year," said Leopold Noel, president of the Seventh Ward Gravity Drainage District.

In 1960, the Iberia-Vermilion Soil and Water Conservation District, the Seventh Ward Gravity Drainage District, and the Vermilion Parish Police Jury applied for Public Law 566 funds to plan the project. After the application was approved by the State Soil and Water Conservation Committee, the Soil Conservation Service completed the plan for the 32,000-acre project in 1963. The plan was approved for construction in 1964.

Several problems had spurred the more than 100 rice farmers in the watershed area into action. Saltwater intrusion, flooding, and agricultural drainage were the three main problems outlined in the application. Plans to solve these problems called for construction of four structures at selected points along the series of ditches and canals. Improvement of the 40 miles of channels and construction of 3.5 miles of protection levees were also part of the project plan. Structure installation got first priority in the two-pronged water-management program.

"The type of structure needed," Noel explained, "was to be the first of its kind in Louisiana, so we went to the Gulf Coast area of Texas to borrow some ideas. We found some over near Anahuac that were just what we needed."

The first structure was completed in 1966. The last one went into place in March of 1967.

"As far back as I can remember, saltwater in Seventh Ward Canal has been a headache," said Raywood Bernard, another drainage district member and rice farmer using the canal water.

"In the last 15 years salt water has been the cause of two almost complete crop failures in 1952 and 1963. Salt water would have taken its toll in profits in 1967 had it not been for structures already in place.

"Rice growth is affected when water with over 45 grains of salt per gallon is applied. The water in the Intracoastal Waterway tested as high as 65 in April.

"More than a hundred pumps are located at different points along Seventh Ward Canal. They pump water on more than 7,500 acres of rice," Bernard pointed out. "I figure my 80-acre crop watered from the canal would have been down 10 to 15 percent without the aid of the structures. Most of the other canal farmers would probably have been in the same boat."

Additional benefits from agricultural drainage and flood prevention as a result of channel improvement and levees are coming from the next phase of the project.

The success of a watershed project doesn't stop with the installation of structures. Soil and water conservation district cooperators also plan to apply conservation land treatment on the 32,000-acre watershed. Practices such as on-farm drainage, land leveling, erosion-control structures, and planting grasses and legumes in rotation are part of these plans ready to be put into action. These practices are geared to help keep down erosion, condition the soil for better water intake, and to bring about total water management.

This project is one of 21 Public Law 566 projects under construction in Louisiana. It is a prime example of how Federal agencies, the State Department of Public Works, and local agencies and groups can work together to solve water-management problems. ♦

Don Huff, woodland contractor, applies herbicide to a large wolf tree that has been girdled.

Conservation district finds contractors to do woodland improvement on farms

Timberland in Holmes County, Ohio, is taking on a new look. Landowners are cooperating with their conservation district to improve the quality of woodlands and make them more valuable in the future.

Holmes County has nearly 90,000 acres of woodland, comprising 30 percent of its area. It is all privately owned. Farm woodlots range from a few acres to about 300 acres per farm.

To encourage woodland improvement and add to the economic assets of the community, the Holmes Soil and Water Conservation District board of supervisors located three woodland contractors and got them started to working in farm woodlands. The Soil Conservation Service helped by planning for woodlands in farm conservation plans, and the Agricultural Stabilization and Conservation Service by sharing the cost of improvement practices. The state forestry division provides onsite technical assistance.

The contractors—John Alazaus of Carrollton, Carl Malthus of Dover, and Don Huff of New Philadelphia—are busy on timber stand improvement projects on many farm woodlands. They girdle undesirable trees, kill grapevines, and chemically treat weed trees. The result is better spacing between the remaining desirable trees.

In the short time the program has been underway, nearly 900 acres has been improved by the woodland-improvement contractors.

Cost of the improvement runs between $15 and $27 an acre. The ASCS cost-shares 80 percent of the total cost. The out-of-pocket expense to the farmer is easily recovered within a couple of years through the new growth that develops as a result of reducing the competition from poor species.

Dave Schatz, farm forester for the Ohio Division of Forestry, works between the district and the landowner. He marks the woodland for the improvement work and develops the cost estimates.

After the work is done, the Ohio Forestry Association reviews the landowner's accomplishments and recognizes those meeting its standards as Tree Farmers. Nearly 30 landowners in Holmes Conservation District have been so honored.—ADRIAN ACHTERMANN, *district conservationist, SCS, Urbana, Ohio.* ♦

Farm Forester Dave Schatz demonstrates to woodland owner, Joe Martuch, Jr., how to girdle a damaged and forked tree.

Water management raises income in RC&D area

The Pri-Ru-Ta Resource Conservation and Development Project in Wisconsin is increasing income of farmers and related businesses as a result of rescuing farmland from excess water.

In 4 years 67 Rusk County landowners have installed 18 group drains to remove excess surface water from 1,500 acres of cropland. They estimate they have increased their total annual income by $29,990.

Alex Turanski says the drain across his land has kept him on the farm. He has added 15 to 20 cows to his herd, an addition to his barn, and he has remodeled his home. Four years ago he was about ready to give up and move away.

Last year Turanski was named the outstanding district cooperator by the Rusk County Soil and Water Conservation District and was the guest of Goodyear Tire and Rubber Company for a week at their ranch in Arizona.

Cropland needing surface drainage in Rusk County.

The Rusk County District coordinated the drainage work. The Agricultural Conservation Program shared the cost, and SCS provided technical assistance for the $52,000 project measure.—NORMAN KAHL AND F. L. ROBBINS, *area extension agent, Wisconsin Extension Service, Ladysmith, Wis., and area conservationist, SCS, Spooner, Wis.* ♦

Conservation for urban people

By LeRoy Willie
District conservationist, SCS, Baton Rouge, La.

What is it like to be a soil conservationist in an urban-suburban area?

Two of us serve East Baton Rouge Parish in the Feliciana Soil and Water Conservation District of Louisiana. The parish has a small land area with a population of about 280,000.

Urban and suburban people earn their living in jobs far removed from the soil. Many of them have a difficult time relating information on soil and water conservation to neighborhood problems, and they do not often volunteer to support conservation programs.

Our aim is to help urban people realize that conservation is meaningful in town as well as country and that the technical knowledge of the Soil Conservation Service can benefit them. We carry out an intensive information program to reach these people, and we work with the governing officials of the boards and commissions to get this technical information and service applied in cities, towns, and suburban areas.

To obtain the support of the general public we conduct a regular live TV program during the noon hour. The program material is taken from a multiparish area around Baton Rouge. We present the material so that it will appeal to urban as well as rural people, a necessity in today's TV programing. The same approach is followed on three radio programs each week.

We also prepare regular newspaper articles plus intermittent full-page feature stories for publication in the Sunday paper.

Official planning bodies in the area are showing increasing concern for good land use and conservation. Realtors and land developers support efforts to speed up soil mapping.

Among recent indications of urban interest in conservation are: The Capital Region Planning Commission has asked the Soil Conservation Service to make a feasibility study of a watershed project to be co-sponsored by the City-Parish Council. The City-Parish Beautification Commission wants SCS to help develop a plan that would hide ugly areas and to beautify other areas. The Louisiana State University and Southern University are cooperators with the Feliciana District, and the Capitol Economic Development Administration has endorsed the idea of resource conservation and development and is asking the local police juries to sponsor an eight-parish RC&D project. ♦

Harmonious balance in urban environment is RC&D goal

A harmonious balance between future urbanization and the natural environment is the aim of the Eastern Connecticut Resource Conservation and Development Project, recently authorized to receive USDA technical and financial help in planning.

The project is sponsored by the Connecticut Commissioner of Agriculture and Natural Resources. The project area includes 890,000 acres in the 40 eastern cities and towns in Tolland, Windham, and New London counties. ♦

Second SCS project in India to help farmers raise yields by water and soil management

A new soil and water conservation demonstration in India to show how methods time-tested by United States farmers can help Indian farmers raise their production is being established by the Soil Conservation Service through joint USDA/U. S. Agency for International Development programs.

The 15,000-acre water-management project in the State of Punjab in northern India is the second to be established in that Nation by SCS and is one of 57 such USDA/AID development projects.

A team of four SCS specialists, with headquarters in the town of Patiala, will work with Indian Government conservationists in operating the Punjab project.

E. Pershing Vance, assistant state conservationist from Bozeman, Mont., will head the team. Other team members are Hubbard Y. Cott, conservation engineer at Hays, Kans.; Kermit E. Larson, soil scientist at Grand Forks, N. Dak.; and Howard M. Ivory, agronomist, SCS, Provo, Utah.

Principal team objective will be to show Indian farmers how the Punjab land, with proper soil and water management, can achieve higher yields of rice, wheat, and other crops.

D. A. Williams, who retired as SCS Administrator in January to become a water-management adviser for the Ford Foundation in India, says water is limited in the Punjab project area but, with proper management, there is enough for productive farming. Soils vary widely, too, but can also be treated and managed for good results.

The water comes from wells and huge impoundments and is transported by great canal systems and, because of distances involved, usually is released by a schedule not always in keeping with farmers' needs.

Many irrigation systems in India are designed so that when water is allotted, every farmer gets some but not always enough for efficient use. This has meant reduced yields at times and high water losses. However, the Government of India now recognizes the need for policy leading to more efficient water use. The SCS project is part of India's efforts to put this policy to work.

An earlier USDA/AID project in the state of Mysore is underway staffed by Guy Nutt, formerly of Denver, as project leader; Eugene J. Pope of Bismarck, N. Dak., civil engineer; Gerald Kester of Escondido, Calif., soil scientist; and Eugene W. Shaw of Nelson, Nebr., agronomist.

Director of the SCS technical assistance program in India is John T. Phelan, former assistant director of the SCS engineering division in Washington. Phelan, in Washington recently for conferences on a proposed third water-management project in the Uttar Pradesh State in North Central India, believes Indian farmers are making rapid strides toward self-sufficiency in agriculture.

"Agricultural progress has top priority in the Indian effort now," he said. "There is a good chance that India will be able to produce all its food needs in just a few years more. Good moisture enabled Indian farmers to produce enough wheat this last season, and in spite of drier conditions, the coming crop may equal last season's. New technology and improved crop varieties are making a big difference."

Serving with Phelan in New Delhi are James R. Coover, soil scientist of Temple, Tex.; Eugene N. Sperry, state conservation engineer for Montana at Bozeman; Donald Jones, agricultural economist from Portland, Oreg.; and Francis Roberts, resource inventory specialist from Ephrata, Wash.

India, a Nation with 535 million people, purchases only negligible quantities of farm products from the United States—currently about $28.9 million worth. If the Indian economy—spurred by such programs as those of SCS—should now begin to move ahead in a rapid sustained fashion, the United States can expect to sell large and growing quantities of United States farm products in exchange for India's tea, copra, and cashew nuts.

In 1968, more than 400 USDA specialists worked in some 40 developing nations of Latin America, Asia, and Africa under USDA/AID programs. ♦

To encourage water-saving structures, the Government of India shares the cost of concrete-lined irrigation ditches and other conservation measures constructed by farmers.

Meetings . . .

North American Wildlife and Resource Conference

The North American Wildlife and Natural Resource Conference will meet in Washington, D.C., on March 2–5. "Conservation in an Urbanizing Society" is the theme of the conference.

Two general sessions will focus attention on the conservation and natural resource problems arising from the shift in population to metropolitan areas. The six technical sessions will report progress in wildlife research and management.

All sessions of the conference are open to the public without charge.

Wildlife Week calls for habitat effort

The growing need to provide and protect living spaces for wildlife will be emphasized during the March 16-22, National Wildlife Week. The theme, "Provide Habitat—Places Where Wildlife Live," is being sponsored by the National Wildlife Federation.

United Nations to consider worldwide pollution problems

The General Assembly of the United Nations has voted to hold an international conference in 1972 to explore the possibilities of cooperation to "eliminate the impairment of the human environment."

A resolution in behalf of the conference, sponsored by 54 members of the 126-nation body, notes the continuing and accelerating pollution of air and water, the deterioration of soil through erosion and overuse, the long-term effects of biocides, and the emotional impact of noise and the pressures of urbanization.

As directed by the resolution, the U.N. Secretary General, after consulting with various authoritative sources, is to report to the next General Assembly on the nature, scope, and progress of all work going on in the field of human environment.

Dates and places

March 2–3, The Wildlife Society, Washington, D. C.

2–5, North American Wildlife and Natural Resources Conference, Washington, D. C.

9–11, National Research Council, Washington, D. C.

9–11, National Association for Community Development, Washington, D. C.

14–20, Associated General Contractors, Washington, D. C.

16–19, National Farmers Union, Hot Springs National Park, Arkansas.

16–20, Association for Supervision and Curriculum Development, Chicago, Illinois.

20–26, National Lawn and Garden Week.

21–25, National Science Teachers Association, Dallas, Tex.

April

9–25, International Commission on Irrigation and Drainage, Mexico City, Mexico.

11–14, National Forest Products Association, Washington, D. C.

19–24, American Society of Planning Officials, Cincinnati, Ohio.

22–23, American Forest Products Industries, San Francisco, Calif.

23–24, Industrial Forestry Association, Portland, Oreg.

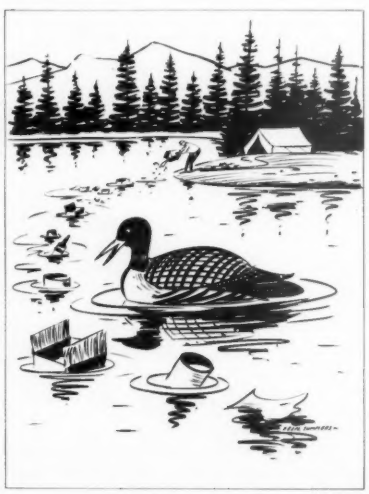
25–29, National Audubon Society, St. Louis, Mo.

28–30, National Academy of Sciences, Washington, D. C.

28–May 2, League of Women Voters, Council Meeting, Washington, D. C.

28–May 2, American Forestry Institute, New Orleans, La.

30–May 1, International Land, Pasture, and Range Judging Contest, Oklahoma City, Okla.



"Littering is loony!" KAB-6

Review

Biological Associated Problems in Freshwater Environments—Their Identification, Investigation and Control. By Kenneth M. Mackenthun and William Marcus Ingram. *1967. Federal Water Pollution Control Administration. 287 pp., illus.; paper. $1.25.*

This book has three stated objectives: To help the person who must investigate, identify, and control biological problems related to water quality; to aid the nonbiologist to understand the aquatic environment; and to provide a guide for gathering and interpreting field data in aquatic biology. These objectives are successfully achieved in 12 clearly written chapters.

The first five chapters review the uses of water and the legal aspects of pollution; explain the intricacies of the aquatic environment and how plants and animals respond to changes; and tell how to investigate aquatic biological problems. The remaining seven chapters deal with aquatic plant and animal pests, how to identify them, and how to control them. Each chapter includes a list of cited literature. The few technical terms that are used are defined in a short glossary.

Anyone concerned with water quality in stream, lake, reservoir, or pond, whether for recreation, industrial, domestic, or some other use will find this book helpful.—Lawrence V. Compton, *head biologist, SCS.*

The Nation's River. *1968. The Department of the Interior official report on the Potomac. U. S. Dept. Int. 128 pp., illus.*

In February 1965 the President directed the Secretary of the Interior to review past plans for the Potomac River Basin and to develop a program which would clean up the river and keep it clean, protect its scenic beauties, and provide

adequate recreation facilities. Among the objectives of the program was to assure an adequate water supply, both now and in the future, for residents of the basin.

This is the final report of the Secretary to the President, presumably a summation of several exhaustive studies by specialized task forces. It is an attractive book of easy-to-follow text, obviously designed to reach the lay reader. It should achieve its purpose and help in understanding the complex problems of the "Nation's River."

The report directs itself principally to the preservation of the scenic values and the development of the recreation potential of the Potomac. One of the positive recommendations urges prompt legislative authorization and funding of a Potomac National River Complex, consisting of federal, state, and local components, to provide a "green sheath" along the main stem of the river from Washington to Cumberland, Md. The report also recommends that the long-deferred restoration and improvement of public facilities along the Chesapeake and Ohio Canal be initiated immediately.

There are other resource development needs in the basin. Of major concern is the problem of increasing pollution in the river, the estuary, and in some of the tributaries. Another is water supply, particularly in the metropolitan area. And erosion and sedimentation are proceeding at the rate of about 2.5 million tons of material deposited in the estuary each year.

The report considers all these philosophically and discusses various methods of control. It recommends that one major reservoir already authorized be funded and constructed immediately; six others are identified.

The report points out that water supply and flooding in localized areas may often be solved with headwater reservoirs included in watershed plans developed by local sponsoring organizations with assistance from the Soil Conservation Service. It indicates that headwater reservoirs are needed and feasible in 61 small watersheds in the basin. The contributions of soil conservation programs in reducing erosion and sedimentation are recognized.

The Potomac River Basin has been studied over a long period of time. Plans have been made and programs have been recommended, but little action has resulted. The major reason is the wide divergence of interests involved. A plan of improvement that would satisfy some interests usually is vigorously opposed by another group. The end result usually is a plea for further study.

Although the report has positive recommendations concerning the preservation of scenic values and the development of recreational opportunities, it becomes vague in other critical areas. This is most apparent in the areas of pollution abatement and water supply which are among the real knotty problems. In these areas, the report follows the time-tested procedure of recommending further study.—CARL D. FETZER, *River Basins Division, SCS, Washington,* D. C.

Extinct and Vanishing Animals. By VINZENZ ZISWILER. *1967. Revised English edition by Fred and Pille Bunnell. Springer-Verlag New York, Inc., New York. 135 pp., illus.; paper. $3.40.*

This is the revised and English version of a book that first appeared in German. It is a reasonably complete report of the subject of its title.

Several accounts, however, are badly garbled. One wonders if these were in the original edition or came about through translation and revision.

It tells how world wildlife is being destroyed, why this should be stopped, and what can and is being done about it.

The authors decry the senseless destruction of the wildlife resources but they are not eccentric nature fanatics. In the introduction to Chapter 5, "Protecting Nature," they state, "The protection of nature must have the preservation of mankind as its ultimate end. Man should and must utilize nature wherever he can and wants; but this utilization must not cause permanent damage to the natural equilibrium." LAWRENCE V. COMPTON, *head biologist, SCS.*

New publications

Biological Conservation. *October 1968. Vol. 1, No. 1. Elsevier Publ. Co., Ltd., Essex, England. $14.40 plus $1.20 postage per volume.* An international journal edited by Nicholas Polunin, Geneva, Switzerland.

Biological Conservation is of special interest to soil conservationists. It is concerned with "the preservation of plants, animals, and all nature, and with the conservation or wise use of the biotic and allied resources of the land, water, and air."

The first issue presents 12 technical papers including several dealing with various aspects of land use and land management. One of these, "Conservation and Land Management" by the Viscount of Arbuthnott, analyzed the 200-year land-use history of a Scottish estate in light of the practicality of the application of conservation principles by a land manager. This interesting paper concludes, "Indeed the landowner or occupier, through his stewardship, is the only effective long-term guardian of the natural resources of the countryside. On his conservation measures, built into the efficiency of his primary land-management function, will depend the kind of rural environment future generations will enjoy."

In addition to the technical papers, there are a large number of shorter articles. There is also a section reporting on conferences and meetings, another one on reviews of important papers and books, and a third one on conservation around the world.

Natural Resources of North Dakota. *1968. U. S. Dept. Int. 46 pp., illus. $0.60.* Twentieth in the Department of the Interior's series of booklets describing the natural resources of the states, this one on North Dakota ranks agriculture as the mainstay of her economy with mineral production and recreation as other major sources of income. The attractive booklet describes the physical environment, mainly one of prairies and plains, and sketches the history of Indian and White settlement. There is also a description of the conservation programs of the various government agencies related in alphabetical order.

Agricultural Development and Expansion in the Nile Basin. By Cline J. Warren. *1968. USDA Foreign Agr. Econ. Rpt. 48. 114 pp., illus.* Completion of the Egyptian High Aswan Dam and the Sudan's Roseires and Kashm El Girba dams in the Nile River Basin will expand the basin's cultivated area by about 3 million acres. This study of the implications for United States agriculture of these developments indicates that if used only for domestic food output the additional cultivated land could erase the area's food deficit. Export crops—notably long-staple cotton—will likely account for a good share of the new land, however, especially in the Sudan. A sizable expansion of cotton acreage in the Nile Basin over the next decade will have a decided impact on world and United States cotton prospects.

Status of Rural Housing in the United States. By Ronald Bird, Lucia Beverly, and Anne Simmons. *1968. USDA, Agr. Econ. Rt. 144. 31 pp.* A summary of data from the 1960 census of housing indicates that rural housing is less adequate than urban housing primarily because a larger percentage of rural homes lack inside plumbing. The authors believe that rural housing has improved considerably since 1960, but the condition of housing occupied by the rural poor may not have improved very much.

Indian American Arts, No. 1. *1968. Indian Arts and Crafts Board, U. S. Dept. of Int. 59 pp., illus. $0.65.*

The first of a new series of publications of special titles deals with the Institute of American Indian Arts at Santa Fe., N. Mex., its students, and their works. It is a part of the Arts and Crafts Board's program to encourage the arts of Native Americans—The Indians, Eskimos, and Aleuts. The new serial supersedes the Board's news circular *Smoke Signals.*

Status of Water and Sewage Facilities in Communities Without Public Systems. By Lucia H. Beverly. *1968. USDA Agr. Econ. Rpt. 143. 20 pp., illus.* Study reports the number, location, and size of communities without public water systems and without public sewage facilities. More than half the communities in the United States are without such facilities. The report summarizes the impact of Federal assistance programs in establishing needed facilities.

A Guide to Understanding the United States Department of Agriculture. *1968. USDA Office of Personnel. (37 pp.), illus.* A simple explanation of the functions and organization of the Department for the information of foreign visitors, students, and similar groups.

Mechanical Seed Cleaning and Handling. By Jesse E. Harmond, N. Robert Brandenburg, and Leonard M. Klein. *1968. USDA Agr. Hbk. 354 56 pp., illus. $0.55.* Superseding Agricultural Handbook 179 of about the same title, this handbook is a guide to understanding, selecting, arranging, and operating seed processing equipment. It describes various types of seed cleaners and related machinery; discusses principles of separation for both commercial and experimental developments; and presents basic concepts of seed handling, storage, and plant layout.

22 Plants Poisonous to Livestock in the Western States. *1968. USDA Agr. Inf. Bull. 327. 64 pp., illus. $0.45.* Each plant is illustrated in color and briefly described with information on where and when it grows, its effect on livestock, symptoms of poisoning, and the way to reduce losses. The bulletin supersedes Farmers' Bulletin 2106, on the same subject.

Managing Grass-Shrub Cattle Ranges in the Southwest. By Hudson G. Reynolds and S. Clark Martin. *1968. USDA Agr. Hbk. 162 (Rev.). 44 pp., illus. $0.20.* Describes the grass-shrub type at the Santa Rita Experimental Range near Tucson, Ariz., and makes recommendations for managing such ranges, based on 40 years of experimental work there and observations throughout the Southwest.

The Golden Nematode Handbook. By Joseph F. Spears. *1968 USDA Agr. Hbk. 353. 81 pp., illus. $1.25.* Survey, laboratory, control, and quarantine procedures.

Index to Volumes 1-20, Journal of Soil and Water Conservation (July 1946 to December 1965). *Soil Conservation Society of America, Ankeny, Iowa. 72 pp. $1.50.*

Soil surveys

Westmoreland County, Pennsylvania. By David C. Taylor, Norman J. Churchill, Craig K. Losche, Samuel D. Mentzer, and Jay B. Weaver. *1968. 68 pp., illus.; maps 4 inches to the mile (1:15,840).*

Worth County, Missouri. By Burton L. Brown. *1968. 50 pp., illus.; maps 4 inches to the mile (1:15,840).* Soils surveyed by Galen E. Kitner, James P. Andrews, and Burton L. Brown.

Muskegon County, Michigan. By Karl E. Pregitzer. *1968. 89 pp., illus.; maps 4 inches to the mile (1:15,840).* Fieldwork by H. Buckley, D. Herst, R. D. Hall, L. R. Jones, T. J. Longwell, W. Myer, K. E. Pregitzer, and E. C. Sease.

Haskell County, Kansas. By Vernon L. Hamilton, Donald R. Jantz, Marion A. Lobmeyer, Quinten L. Markley, and William R. Swafford. *1968. 49 pp., illus.; maps 3.17 inches to the mile (1:20,000).*

Pierce County, Georgia. By Howard T. Stoner. *1968. 43 pp., illus.; maps 3.17 inches to the mile (1:20,000).* Fieldwork by Howard T. Stoner, John H. Johnson, and D. Gray Aydelott.

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From the Administrator

Help for wildlife on private land

The preservation and improvement of wildlife habitats on privately owned land has always been a major concern of the Soil Conservation Service. Today, as conservation concepts broaden with respect to a rapidly changing environment, it is ever more important to emphasize wildlife values in natural resource programs.

This importance grows from the realization that wildlife lives within the same environment and shares the same resources as people. The way land and water resources are used affects the different kinds of wildlife according to their various ecological relationships. Their environment is altered most where the human population is growing most rapidly.

In intensively farmed areas, wildlife is almost eliminated from the scene unless landowners give conscious attention to the basic requirements of food, cover, and water. It is to the credit of farmers that a high percentage of them do appreciate the presence of birdlife around their farmsteads and encourage game and other wildlife in their fields and pastures.

In nearly every community, a few landowners dedicate a part of their acreage to wildlife habitat and succeed in keeping good numbers of wild birds and mammals on their property. Some go so far as to produce wildlife as a crop, either for their own and their friends' enjoyment or as a part of an income-producing enterprise.

SCS soil conservationists are prepared to help conservation district cooperators plan a place for wildlife in their operations, and biologists are available for consultation on special problems. Conservation districts also help to bring the services of specialized wildlife agencies, both federal and state, to the attention of landowners and to arrange for planting materials and other aids to habitat improvement.

In recent years there has been widespread concern over the dwindling acreage of wetlands available for wildlife habitat. The Soil Conservation Service gives special attention to this problem in working with individual landowners. The soil conservationist interprets soil resource information in terms of feasible alternative systems of land use and land treatment. If there are wetlands, he explains their use and management for wildlife. The fact that landowners frequently decide in favor of wildlife is shown by the record that in 1968, some 259,000 acres of wetland was set aside and maintained, and 81,000 acres was created or improved for wildlife.

The Agricultural Conservation Program administered by the Agricultural Stabilization and Conservation Service includes two practices that provide cost-sharing for the construction or restoration of water areas for wildlife. The Soil Conservation Service provides the landowner with the technical assistance necessary to establish these practices.

Another activity that benefits migratory waterfowl and other wildlife is the encouragement of landowners to build farm and ranch ponds. ACP cost-sharing and SCS technical assistance have helped construct more than 2 million such ponds that have increased the area of open water by well over 2 million acres. These ponds have brought permanent water to areas where none existed before. They account for a large percentage of the ducks now produced in the United States.

It is in the public interest that a maximum variety of wildlife species be preserved and maintained on privately owned land. As human population grows, the public demand for wildlife increases. Landowners are not always able to recognize and meet this demand without financial and technical assistance.

Assistance in developing conservation plans and applying conservation practices that build habitats and encourage wildlife are, therefore, an important function of SCS conservationists and soil conservation districts.

Kenneth E. Grant

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Irrigation water for New Mexico community

During the last 2 years, Community Ditch District Commissioners Bill Eldridge, Mariano Lucero, and Esquipula Garcia have helped their New Mexico community get a new diversion dam and structures to convey irrigation water across six arroyos.

Plans are being made to install additional structures and to realine parts of the community ditch.

It was Bill Eldridge who set the pattern for others to follow. He leveled his small 10-acre farm and installed a 700-foot concrete-lined irrigation ditch.

The leveling had to be a precision job because of the steep slopes and shallow soil. Soil Conservation Service specialists through the Jemez Soil and Water Conservation District designed and staked 13 graded benches and also the irrigation ditch with a turnout for each bench. Eldridge did his own leveling and hand-formed his own ditch lining.

Because of this work, irrigation water no longer turns the earthen ditch into an arroyo. The water no longer races across the slope. Instead, it runs into the benches through metal gates where it spreads evenly throughout the length of each border. A good job of irrigating can now be done in less than half the time it previously took to run water across the slope.

By next spring, Eldridge should have a good pasture from his recently planted fields, one of orchardgrass and another of tall wheatgrass.

Bill Eldridge (above, right) and helper make preparations to place hand-formed concrete in irrigation ditch. Below, Eldridge prepares land for planting irrigated pasture.

Bill Eldridge became a cooperator with the Jemez District in 1965. He is now chairman of the district board of supervisors and chairman of the Canones Community Ditch Commission.—RICHARD L. BARBER, *district conservationist, Bernalillo, N.Mex.* ♦